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Natural Pruning in Ponderosa Pine

Measurements on the progress of natural pruning in second growth stands of ponderosa pine were made near the Boise Basin Experimental area during the summer of 1935. The study was conducted in sixty-year old stands ranging in normality from 31 percent to 115 percent. The results based on 22 plots indicated that even in overstocked stands natural pruning is extremely slow. The average clear length for stands of this age and all densities combined was only about 1.5 feet, with a range of 0.1 to 5.8 feet, density of stand affecting primarily the length of the dead portion of the crowns.

During the summer of 1936 a supplementary study was made to determine the persistence of dead limbs at 1, 5, 9, and 17 feet above the general ground level. The following method was used to determine the length of time dead limbs may persist; At the 4 whorls nearest to the 4 height points indicated above, the branches were cut flush with the bark and the annual rings on the branch stubs counted: The tree was then bored in the same whorl in which the branch count was made, and the age of the tree at that section determined. The difference between the age of the tree (at the node in which the branch had been growing) and the age of the branch (as shown by its ring count) gives very nearly the number of years the branch has been dead.

Measurements were taken on 30 randomly selected dominant or codominant trees on each of three aspects within a single drainage. Preliminary results are summarized in the table below.

Table I. Rate of Natural Pruning in Ponderosa Pine

	North Slope				Draw Bottom				South Slope			
No. of trees	30				30				30			
Average spacing 1/	9.6				17.8				28.4			
Average height to lowest dead limb.	2.5				2.5				1.4			
Average height to lowest live limb.	26.8				18.3				9.3			
No. of whorls (0'-9')	10.4				9.3				10.9			
No. of whorls (9'-17')	8.1				7.1				7.1			
Ave. No. of years to grow last ½" of radius	12.8				8.9				6.1			
Ave. No. of years to grow 1" of radius	20.3				15.4				11.2			
	Height above ground - feet											
	1	5	9	17	1	5	9	17	1	5	9	17
Ave. age of tree	60.2	53.0	47.4	39.2	53.0	47.2	42.7	35.8	51.0	43.6	37.4	29.8
Ave. age of dead limbs	6.8	12.1	16.7	17.4	9.5	15.0	19.8	21.4	11.5	24.6	25.4	18.0 2/
Ave. persistence of dead limbs in years	53.4	40.9	30.7	21.8	43.5	32.2	22.9	14.4	39.5	19.0	12.0	11.8
Ave. no. of limbs per whorl	0.2	2.26	3.0	2.96	0.27	2.80	3.56	3.26	1.27	2.73	2.56	3.20
Ave. diameter of dead limbs	0.37	0.66	0.94	1.04	0.51	0.67	1.06	1.25	0.46	1.30	1.53	1.16 3/

1/ Obtained by measuring from sample tree to the boles of the 3 nearest competing trees and averaging the 3 resulting measurements.

2/ & 3/ Based on only a few limbs since on south slope trees none of the whorls was completely dead at the 17-foot height, only the smallest, weaker ~~ones~~ limbs having died.

average no. of years limbs have been dead.